

**A new species of the genus *Gastrosaccus*
(Crustacea: Mysidacea: Mysidae) from Oman**

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Abstract.—A new species, *Gastrosaccus trilobatus*, is described based on specimens from sandy beaches of Oman. The new species is distinguished from known species of the genus by the carapace and telson. The carapace is provided with 3 posteriorly directed lobes on the posterodorsal margin, and the telson is armed with 2 distal conspicuously large spines and 4 or 5 spinules inserted between them.

The genus *Gastrosaccus* was established by Norman in 1868, and now contains 17 species as far as we can determine. List of these species, in company with their localities, are shown in Table 1. It is distinguished from related genera by the third male pleopod with the styliform exopod and the multi-segmented endopod, the uniramous female pleopods except for the first pair which is biramous, and the labrum without accessory spines in both sides of the median spiniform process. The present new species was collected during an ecological study of sandy beaches in Oman, Arabian Peninsula, by one of the authors (AM). The type specimens are deposited in the Zoological Museum, University of Copenhagen.

Gastrosaccus trilobatus, new species
Figs. 1-3

Type series.—Holotype (CRU 3411), adult male (6.0 mm); allotype (CRU 3412), gravid female (7.3 mm); paratypes (CRU 2419), 1 adult gravid female (5.8 mm), 3 immature males (4.6, 3.5, 3.3 mm) and 1 immature female (3.5 mm); Khaluf, Oman, 20°25'N, 58°00'E, sandy beach, 6 November 1995, coll. A. McLachlan. Other para-

types (CRU 2420), 2 adult males (5.6, 6.5 mm), 1 adult female (5.5 mm) and 1 immature female (5.4 mm), Majis, Oman, 24°30'N, 56°40'E, sandy beach, 27 September 1995, coll. A. McLachlan; 2 specimens of which, male of 6.5 mm and adult female, were dissected for drawing.

Description.—Rostrum low triangular with narrowly rounded apex, somewhat bent downwards, covering basal part of eyestalks (Fig. 1A, B). Anterolateral corner of carapace rounded. Posterior margin of carapace deeply emarginate, leaving last thoracic somite uncovered dorsally, split in each side of emargination, overlapping with posterolateral margin; emarginated part furnished with 3 lobes, median lobe elongate triangular with pointed apex, side lobes bill-shaped, directed posteriorly, not reflected; posterior and posterolateral margins from side lobe to posterolateral angle weakly serrated (Fig. 1C). Posterolateral angle of carapace rounded, covering side of first abdominal somite.

Eye well developed; cornea as wide as or slightly wider than stalk (Fig. 1A, B).

Antennular peduncle of male more robust than that of female; first segment shorter than combined length of second and third segments, with 4 short setae at anterolateral

Table 1.—List and localities of 18 *Gastrosaccus* species.

Species	Localities	Authorities
<i>G. australis</i> W. M. Tattersall	New Zealand	W. M. Tattersall 1923
<i>G. bispinosa</i> Wooldridge	S. Africa	Wooldridge 1978
<i>G. brevifissura</i> O. S. Tattersall	S. Africa	O. S. Tattersall 1952, 1962
<i>G. daviei</i> Băcescu & Udrescu	NE Australia	Băcescu & Udrescu 1982
<i>G. dunckeri</i> Zimmer	Between Ceylon and New Guinea	Zimmer 1915
	India	W. M. Tattersall 1922, Pillai 1973
	E. Africa	O. S. Tattersall 1958
	Singapore waters	O. S. Tattersall 1960
	S. China Sea	Ii 1964
<i>G. kemp</i> W. M. Tattersall	India	W. M. Tattersall 1922
	S. Africa	O. S. Tattersall 1962 (as <i>G. gordonae</i>)
	Arabian Gulf	Murano (1998)
<i>G. longifissura</i> Wooldridge	S. Africa	Wooldridge 1978
<i>G. mediterraneus</i> Băcescu	Mediterranean	Băcescu 1970
<i>G. msangi</i> Băcescu	Tanzania	Băcescu 1975
<i>G. namibensis</i> Wooldridge & McLachlan	Namibia	Wooldridge & McLachlan 1987
<i>G. olivae</i> Băcescu	Orange River estuary	O. S. Tattersall 1955 (as <i>G. sanctus</i>)
<i>G. psammodytes</i> O. S. Tattersall	S. Africa	O. S. Tattersall 1958
<i>G. robusta</i> Panampunnayil	SE Australia	Panampunnayil 1989
<i>G. roscoffensis</i> Băcescu	France	Băcescu 1970, Nouvel 1972
<i>G. sanctus</i> (van Beneden)	Atlantic coasts of Europe and Africa, Mediterranean	Tattersall & Tattersall 1951
<i>G. sorrentoensis</i> Wooldridge & McLachlan	W. Australia	Wooldridge & McLachlan 1986
<i>G. spinifer</i> (Goës)	Atlantic coasts of Europe and Africa, Mediterranean	Tattersall & Tattersall 1951, Lagardère & Nouvel 1980
<i>G. trilobatus</i> , new species	Oman	Present record

corner; second segment shortest, wider than long, with 3 spines on dorsolateral surface and 1 short and 1 long setae at inner distal corner; third segment 1.5 times longer than wide, with 2 spinules on dorsal surface, noticeable digitate process present on dorsal surface near base of outer flagellum. Female antennular peduncle with first segment as long as second and third segments combined, second segment with 2 long and 1 short setae at outer distal corner. Outer flagellum with basal lobe fringed with sensory setae (Fig. 1A, B).

Antennal scale extending to distal end of second segment of antennular peduncle in male, slightly less in female, slightly more than 3 times longer than broad; lateral margin slightly convex, naked, terminating in spine extending to apex of scale, distal suture distinct (Fig. 1D). Antennal peduncle

shorter than antennular peduncle, longer than antennal scale; second segment longest, more than twice longer than broad, armed on inner margin with 4 plumose setae of which distal one is longest and thickest; third segment 0.4 as long as second, with 3 plumose setae on inner margin of which distal one is longest and thickest (Fig. 1D).

Labrum longer than broad, with long median spiniform process (Fig. 1H). Mandibular palp slender, third segment $\frac{1}{3}$ of second segment in length (Fig. 1E). Maxillule and maxilla as shown in Fig. 1F and G, respectively. Hook-shaped anteromedian process present on ventral side of clypeus (Fig. 1I).

First and second thoracic limbs with endopod rather slender (Fig. 2A, B). Endopods of third to eighth limbs similar in shape, ischium longer than merus, ischium

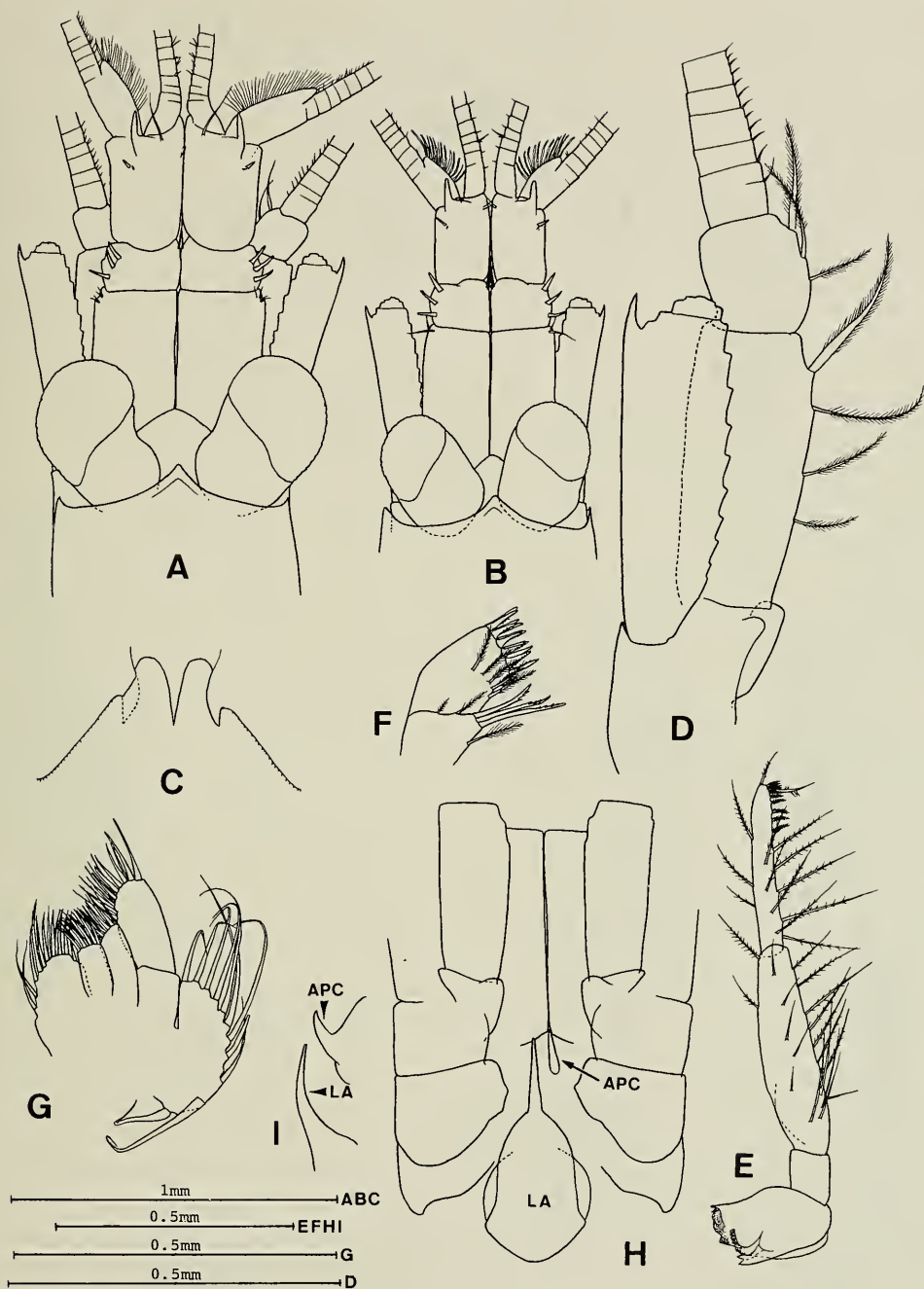


Fig. 1. *Gastrosaccus trilobatus*, new species, A, D, E, G, I, male (6.5 mm); B, C, F, H, female (5.5 mm). A, anterior end in dorsal view; B, anterior end in dorsal view; C, posterodorsal margin of carapace; D, antenna; E, mandible and mandibular palp; F, maxillule; G, maxilla; H, anterior end in ventral view; I, anteromedian process of clypeus (APC) and anterior part of labrum (LA) in lateral view.

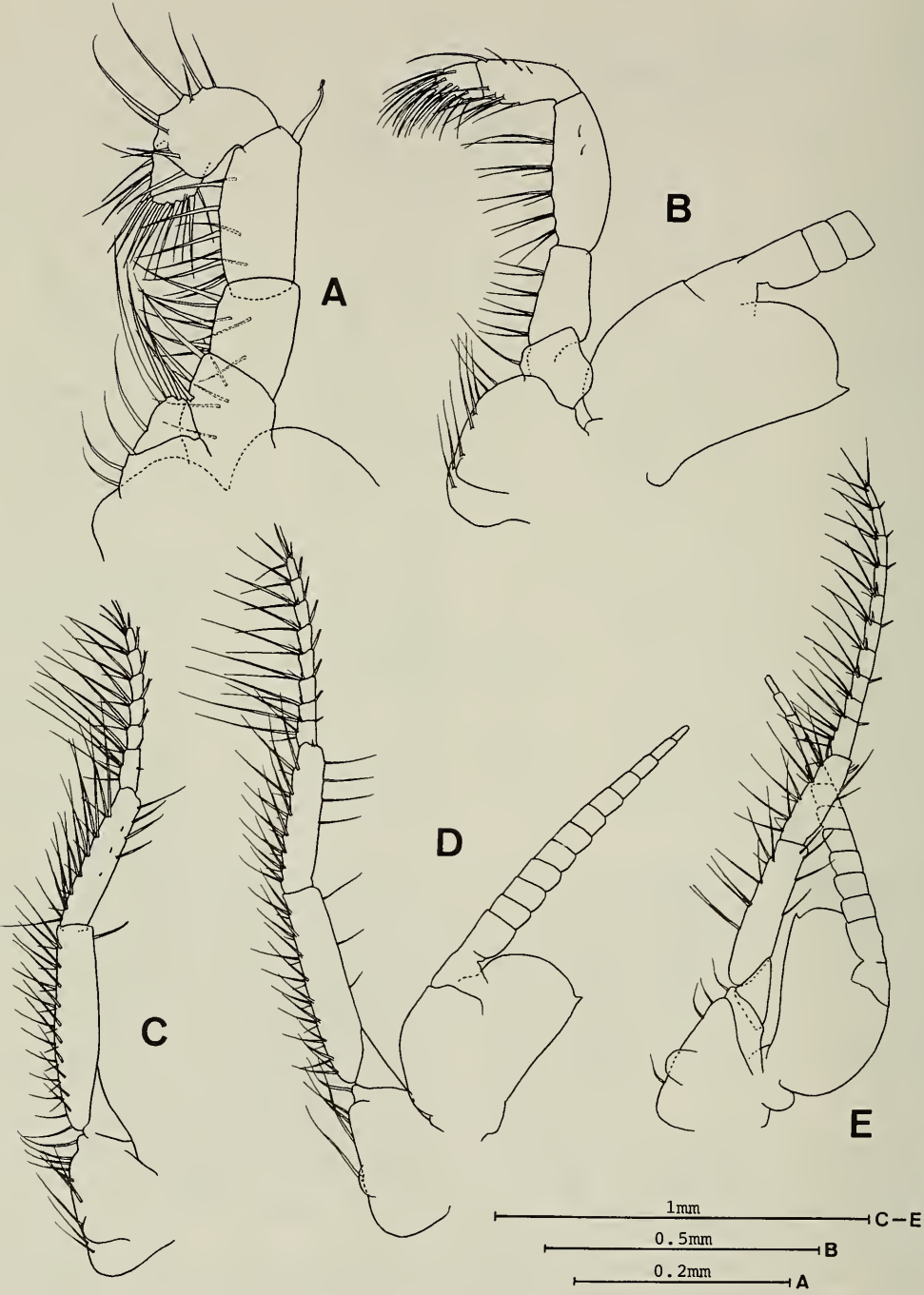


Fig. 2. *Gastrosaccus trilobatus*, new species, male (6.5 mm). A, endopod of first thoracic limb; B, endopod and proximal part of exopod of second thoracic limb; C, endopod of third thoracic limb; D, fifth thoracic limb; E, seventh thoracic limb.

and merus shortened and carpopropodus lengthened toward posterior pairs, carpopropodus subdivided into 6 to 10 subsegments increasing in number toward posterior pairs (Fig. 2C–E). Basal plate of thoracic exopods with distolateral corner pointed in second to seventh limbs (Fig. 2B, D, E) and rounded in first and eighth limbs. Flagella of thoracic exopods 10-segmented in first limb, 11 in second and third, 12 in fourth to eighth (Fig. 2D, E).

Abdomen with second and third somites shortest, fifth somite 1.5 times longer than fourth, sixth somite 1.2 times longer than fifth.

All pleopods of male biramous. First pleopod with 8-segmented exopod and unsegmented endopod, sympod with 9 plumose setae along lateral margin (Fig. 3A). Second pleopod with 7-segmented endopod and 8-segmented exopod, exopod much broader and longer than endopod, distal 3 segments extending beyond apex of endopod, each of proximal 4 segments armed at outer distal corner with thick seta, proximal part of which has undulate outer margin (Fig. 3B). Third pleopod: exopod extremely elongate, styliiform, exceeding distal end of sixth abdominal somite, 4-segmented, first segment longest, indistinctly divided into about 4 subsegments, second segment as long as third and fourth segments together, second and third segments unarmed, fourth (distal) segment shortest, 0.37 as long as third, armed with 2 strong, subequal, barbed setae on distal end and short seta on distal third of lateral margin; endopod 6-segmented, extending beyond middle of first segment of exopod (Fig. 3C). Fourth pleopod with unsegmented endopod and 8-segmented exopod (Fig. 3D). Fifth pleopod allied to fourth but slightly smaller, endopod unsegmented, exopod 7-segmented (Fig. 3E). Female pleopods: first pleopod biramous, endopod unsegmented, shorter than exopod, with naked seta at tip; exopod unsegmented, with 3 plumose setae on distal end; sympod cylindrical, outer margin with 2 long setae near proximal end and 3 setae

on distal end (Fig. 3F). Second to fifth pleopods uniramous, slender (Fig. 3G).

Endopod of uropod longer than exopod, with 8–10 strong spines on ventral inner margin from statocyst region to near distal end. Exopod of uropod truncate distally, as long as telson, armed along lateral margin with 12 strong spines arranged regularly (Fig. 3I).

Telson slightly longer than last abdominal somite, 2.3 times as long as maximum width at base; cleft more than $\frac{1}{6}$ of telson length, armed with 15–20 spinules on either side; each apex of distal lobes with 1 strong spine; lateral margin nearly straight, with 6–7 large spines, distal one conspicuously larger than others and slightly larger than apical spine; 5 and 1 spinules inserted between apical spine and distal conspicuously large lateral spine and between fourth and fifth large spines, respectively (Fig. 3H); single spine present on median anteroventral line.

Etymology.—Derived from 3 lobes on the posterodorsal margin of the carapace.

Remarks.—In the new species the telson bears spinules between the apical spine and the distal spine of the lateral margin. To date, such a telson is recorded in 5 species of the genus *Gastrosaccus*, *G. bispinosa* Wooldridge, 1978, *G. brevifissura* O. S. Tattersall, 1952, *G. kempi* W. M. Tattersall, 1922, *G. longifissura* Wooldridge, 1978, and *G. msangi* Băcescu, 1975. The new species is easily distinguished from them by the 3 lobes on the posterodorsal margin of the carapace and the 2 conspicuously large distal spines on the telson.

There are intraspecific variations in the depth of the apical cleft and the armature on the lateral margin of the telson. In an adult female (5.8 mm) from Khaluf, the apical cleft of the telson is shallower (about $\frac{1}{7}$ of telson length), more divergent posteriorly and the spinules are fewer in number. Moreover, the lateral margin of the telson is armed with 7 large spines, and the number of inserted spinules is one each in spaces between fourth and fifth, fifth and sixth,

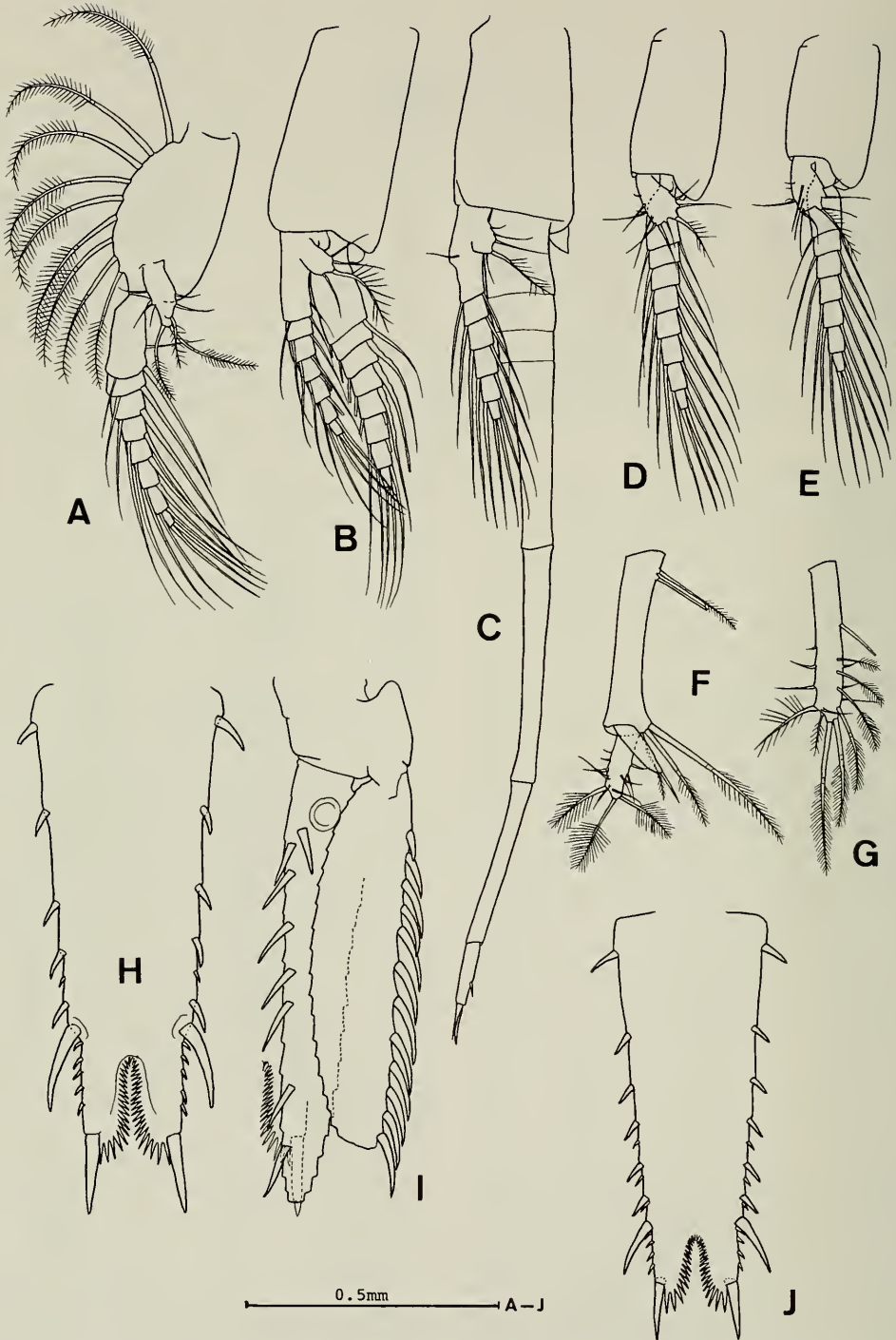


Fig. 3. *Gastrosaccus trilobatus*, new species, A-E, H, I, male (6.5 mm); F, G, female (5.5 mm); J, female (5.8 mm). A, first pleopod; B, second pleopod; C, third pleopod; D, fourth pleopod; E, fifth pleopod; F first pleopod; G, third pleopod; H, telson; I, uropod in ventral view; J, telson.

and sixth and seventh large spines and 4 in the space between the seventh and apical spines (Fig. 3J).

A prominent spine on the median line of the anteroventral surface of the telson was found in the new species. A similar spine was reported for *Gastrosaccus sorrentoensis* and *G. psammodytes*. As noted by Wooldridge & McLachlan (1986), it may be a common character in the genus *Gastrosaccus*.

Ecological note.—*Gastrosaccus trilobatus* was found on all 10 beaches surveyed in Oman in numbers ranging from 54–4128 per meter transect and up to 300 individuals/m². It tended to be more common on the most exposed beaches. Intertidal distribution of the mysids during low tide was across the saturated lower shore and into the surf zone. Numbers peaked between the mid tide and spring low tide levels. The beaches in Oman have fine sand and are mesotidal with a maximum tide range of 3 m. Wave energy is low except in the south. Water temperature and salinity on the sampling days were 27–33°C and 31–36 PSU, respectively. More ecological information is forthcoming.

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